

HONORS SENIOR *presentations*

APRIL 20, 2021



CLARION
UNIVERSITY



16TH ANNUAL
CELEBRATION OF
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SERIES



OPENING CEREMONY *program*

Tuesday, April 20, 2021
5:30 p.m.

**Zoom Link: <https://clarion.zoom.us/j/99847125718>
Passcode: 042021**

Welcome and Introductions..... Megan Schaefer
Honors Program Student Director

Remarks and Presentation of Seniors and Faculty Advisors..... Dr. Rod Raehsler
Honors Program Director

Presentation of Honors Stoles..... Dr. Joseph Croskey
Honors Program Assistant Director

Closing Dr. Rod Raehsler
Honors Program Director



SENIOR PRESENTATIONS SPRING 2021

CONCURRENT SESSION 1 (6:15 P.M.)

Moderator: Dr. Andrew Lingwall

Zoom Link: <https://clarion.zoom.us/j/92010988609>

Stimulation: A Revamp of the Honors Program Website

Cyrique Pitt

Effects of Anxiety in the Classroom

Macy McCarthy

The Inquiry Design Model in Social Studies Education

Isabelle Morrison

CONCURRENT SESSION 2 (6:15 P.M.)

Moderator: Dr. Joseph Croskey

Zoom Link: <https://clarion.zoom.us/j/96550339532>

Passcode: 767243

Bias in Machine Learning Algorithms: Causes, Examples, and Effects

Gina Bennett

Wearing Scrubs Outside the Hospital Environment

Levi Hughes

The Roles of Sexuality and Campus Involvement in Perceived Social Support

Lindsay Filcheck

Examining ImPACT Testing in High School Athletes: Do Players Sit Out?

Kaitlyn E. Gage

CONCURRENT SESSION 3 (6:15 P.M.)

Moderator: Dr. Rod Raehsler

Zoom Link: <https://clarion.zoom.us/j/96316280449>

Passcode: 865350

Internationalizing Remarketed (Pre-Owned) Medical Equipment in Developing Countries through Donation Groups

Jenna Tech

Impact of COVID-19 on Workplace Management, Training and Communication

Logan Moore

COVID-19 In Cambodia: The Effect of Healthcare and Developmental Assistance

Sara Custer

A Study on Commuters' Preferences for 100% Low-Floor Streetcar

Megan Schaefer

CONCURRENT SESSION 4 (6:15 P.M.)

Moderator: Dr. Jessica Thomas

Zoom Link: <https://clarion.zoom.us/j/94660151546>

Passcode: sp2021

Platelet Mediated Regenerative Technology

Thomas Peyton Jr.

Do Patients Receiving Alternative Therapies Have a Better Outcome Than Patients Receiving Conventional Psychostimulants?

Haley Crosby

Plasmid Recovery of Novel UPRE

Zachary Wildeson

CONCURRENT SESSION 5 (6:15 P.M.)

Moderator: Dr. Natasha Dias

Zoom Link: <https://clarion.zoom.us/j/3172603078>

Passcode: 13579

Understanding Cellular Stressors and UPR Induction of a Novel UPRE in *Saccharomyces cerevisiae*

Sarah Bridges

The Role of Annexin A1 in the Phagocytosis of Undifferentiated Cancer Cells by Macrophage-Like Cells as a Potential Cancer Therapeutic for Myeloid Leukemias

Kimberly Westover

Plaque Biofilm Organisms and Molecular Characterization

MyKenzie Hoffman

2020-2021 HONORS STUDENTS

Quinn Arbaugh	Harley Craig	Elizabeth Hightree	Isabelle Morrison	Marissa Sheffer
Brianna Barger	Haley Crosby	Tyler Hilbert	Katherine Mortier	Ali Shepard
Martin Bastecki	Kylee Cross	Andie Hill	Olivia Mott	Thomas Simpson
Kaden Bauer	Sara Custer	Mykenzie Hoffman	Megan Mulhair	Ruby Skow
Delaney Beard	Elysia Davila	Taylor Hoffman	Allie Myers	Christian Smith
Kayli Becker	Amanda Dolekary	Halle Hooks	Rilee Myers	Charli Smith
Kirsten Bellesfield	Jon Jacob Dorty	Levi Hughes	Austin Nardi	Faith Smith
Gina Bennett	Liam Dunfee	Megan Hull	Dylan Neiswonger	Amber Smoyer
Justine Berkhouse	Kayla Eaton	Jennica Hunter	Lucas Nichols	Nolan Songer
Anish Bhagwat	Kaitlyn Faber	Samantha Huth	Brandon Nielsen	Katya Sosnowski
Trevor Black	Camryn Fahr	Abbi Johnson	Amanda Oakes	Sydney Spang
Atalie Blankenbuehler	Alice Fernald	Bryan Kelly	Aubry Ohlson	Emma Spitz
Chloe Blashford	Jessica Fesenmyer	Emily Keltz	Myia Page	Jacqueline Sprenger
Jillian Bowman	Lindsay Filcheck	Cassidy Kemmer	Marissa Paredes	Jaclyn Springer
Alice Bowser	Brittany Fitzgerald	Meghan Keppler	Corina Paszek	Grace St.Clair
Kevin Bradley	Faith Forry	Ashley Kerrigan	Sterlling Pedersen	Victor Stahlman
Peyton Bramble	Anna Foster	Emily Kiner	Lindsay Perry	Robert Stilwell
Nathan Brant	Victoria Freeny	Clay Klein	Nathan Petke	Alexis Strouse
Allison Breski	Hailey Fry	Paige Kobsik	Thomas Peyton	Travis Swartz
Sarah Bridges	Naomi Fry	Hanna Koziarski	Emily Phillips	Jenna Tech
Erin Briggs	Kaitlyn Gage	Audra Kozlowski	Cyrique Pitt	Gabriella Tepke
Sylvia Bright	Caleb Gardner	Urban Laney	Julie Powers	Madison Trimbur
Elijah Brinsky	Sarah Garrett	Jaylee Lassinger	Sarah Probst	Ann Tyger
Patricia Brown	Abigail Gatesman	Sadie Leisinger	Cassidy Reed	Victoria Vega
Zoey Brown	Regan Gaydash	Katherine Lewis	Amy Regrut	Alexandra Velez
Oriana Burgos	Michael Gilbert	Jasmine Long	Emily Reinard	Joseph Vitali
Christianne Burns	Gage Gray	Madison Madine	Kerri Rich	Hannah Waltz
Mackenzie Carver	Abigail Greenburg	Heather Mahoney	Katherine Richardson	Cassandra Westover
Yelena Carvin	Devin Greener	Claire Mapes	Kathryn Robinson	Kimberly Westover
Giovanni Catalone	Andrew Guth	Zachary Marcic	Madison Rocap	Erin Wheeland
Mara Chappie	Makayla Guzik	Alexis Mazur	Cameron Rodriguez	Cody Wibirt
Jessica Cline	Grace Haggard	Katera McCann	Cheyenne Rosenberg	Jacob Wilcox
Katelyn Cline	Nathan Hallowich	Ryanna McCann	James Ross	Zachary Wildeson
Danielle Coleman	Camden Hankey	Macy McCarthy	Samuel Santangelo	Gabriel Wiley
Kalyn Combetty	Kayla Hare	Elaina McClelland	Megan Schaefer	Rachel Williams
Jaycie Conklin	Kelsey Hasselman	Yaminah Merando	Marcy Schindler	Jordyn Wilson
Siara Conley	Bethany Havrilla	Marleen Meyer	Avari Schwabenbauer	Aubrey Wrona
Clinton Connelly	Ethan Heeter	Will Meyer	Abigail Selfridge	Jessica Yarger
Christina Cotton	Emily Hegedus	Evan Miller	Skylar Shank	Aly Yassenka
Lauren Cousins	Jenna Henderson	Alexes Miranda	Samuel Shannon	
Allison Cox	Kara Hershey	Logan Moore	Victoria Shannon	

GINA BENNETT

Bias in Machine Learning Algorithms: Causes, Examples, and Effects



Machine learning algorithms make life-altering decisions for millions across the nation in all areas of life. Hiring, college admissions, loans, and criminal justice are areas with decisions often made by machine learning algorithms.

Bias is introduced to machine learning algorithms via three main sources and can have unfair and negative effects. Presented will be examples of bias in machine learning algorithms as well as the consequences that resulted.

Dr. Kate Overmoyer, Advisor

Gina Bennet is from Byrnedale, Pa. She will receive a Bachelor of Science in Mathematics with a concentration in financial mathematics and actuarial sciences as well as a Bachelor of Science in Computer Science. Throughout her undergraduate career, Gina was a member of Pi Mu Epsilon and the Mathematics Honor Society. After graduation, she hopes to pursue an actuary career in Pittsburgh.

SARAH BRIDGES

Understanding Cellular Stressors and UPR Induction of a Novel UPRE in *Saccharomyces cerevisiae*



Accumulation of misfolded proteins within a specialized organelle of cells, the Endoplasmic Reticulum (ER), is the physiological cause of many human diseases, including Alzheimer's, Parkinson's and Cystic Fibrosis.

In diseased cells, abnormal proteins aggregate, or collect together, causing high levels of cellular stress and later inducing programmed cell death, apoptosis. To combat this process, cells have evolved a constitutive protein quality control pathway to clear out abnormal proteins, called Endoplasmic Reticulum Associated Degradation (ERAD). However, if the ERAD mechanism gets overwhelmed by too many aberrant proteins, the Unfolded Protein Response (UPR), a cellular signaling pathway, is instructed to expand the ER and increase synthesis of cellular chaperones and proteins to aid the ERAD. UPR is known to upregulate translation and transcription factor Hac1p which binds to the UPR-Element (UPRE) promoter region of UPR target genes.

Formerly, a novel UPRE, ADD66, was discovered and presumed to be necessary for gene expression during cellular stress. My project aimed to discover if the sequence of ADD66 is recognized for upregulation of gene expression by inducing cellular stress in yeast cells and analyzing their response via Bradford and β -galactosidase assay. Additionally, my project aimed to generate a profile or baseline of the effects of different stressors, DTT, β -mercaptoethanol, heat and DMSO on the resultant UPR induction.

Dr. Craig Scott, Advisor

Sarah is from Johnstown, Pa. She is a pre-dental molecular biology major and will receive a Bachelor of Science degree upon graduation. At Clarion University, Sarah received the Clarion High Achiever Scholarship that awarded her full tuition (2017–present) as well as the France Allison Honors Scholarship (2019). She is a member of Tri Beta (biology honors society) and the Honors representative for the Class of 2021. After graduation, Sarah will attend Lake Erie College of Osteopathic Medicine's (LECOM) School of Dental Medicine in Bradenton, Fla.

HALEY CROSBY

Do Patients Receiving Alternative Therapies Have a Better Outcome Than Patients Receiving Conventional Psychostimulants?



The overprescription of psychostimulants, in particular ADHD medications, has been a steadily increasing issue for all age populations. In this study, I mainly focused on the overprescription of psychostimulants, and compared the benefits of alternative therapies to these medications.

Within this study, I examined ages 0-18, 19-40, 41-65 and 65-99. Each of these groups was randomly chosen and each participant had around the same severity of symptoms. Each age group divided; half received a psychostimulant, while the others received an alternative therapy. The results were compared to determine if alternative therapies are more effective than traditional medications in order to attempt to decrease the overprescription of psychostimulants.

Most psychiatric conditions, including ADHD, do not have a definitive test. These medications are prescribed by the interpretation of symptoms by rushed doctors, worried parents, or any patient looking to receive a pill to ease their mind. Roger Griggs, the pharmaceutical executive that introduced Adderall in 1994, compared the effects of these types of medications to the effects of a nuclear bomb. He then went into the harsh side effects of these medications, especially for those who do not need them.

Study results could raise awareness about overprescription, decrease overall prescription of these medications and provide symptomatic patients with the correct therapy in order to achieve the best quality of life.

Dr. Kristina Brozoza-Lewis, Advisor

Haley is from Sarver, Pa. Upon graduation, she will receive a Bachelor of Science in Nursing. At Clarion, Haley received Dean's List recognition as well as the Sarah Beels Dunkoski Memorial Scholarship, Addison Gibson Scholarship and Janet Schreckengost Scholarship. Additionally, Haley was actively involved in The National Society of Leadership and Success, Phi Eta Sigma Honors Society, Advisory Board for Leadership and Engagement, Cru, Chorus, Circle K and the rugby team. She was family coordinator and secretary for Special Olympics and the section squad leader for marching and concert bands on campus. Following graduation, Haley will be employed in the ICU/Medial Surgical unit at Clarion Hospital while pursuing an MSN and DNP.

SARA CUSTER

**COVID-19 In Cambodia:
The Effect of Healthcare and Developmental Assistance**



Relatively low numbers in Cambodia throughout the COVID-19 pandemic spark an interesting examination of what affects the health and safety of citizens within a nation. By examining COVID case numbers as a dependent variable, healthcare and developmental assistance can be used to find links in developing economics for improving national health and safety.

Dr. Sandra Trejos, Advisor

Sara Custer is from Pittsburgh, Pa. She is an international business and economics double major and will receive a Bachelor of Science in Business Administration upon graduation. While pursuing her undergraduate career, Sara received Dean's List recognition for four years. She received the Student Senate Chair of the Year Award and earned a TQUK Level 5 Certificate in Teaching English as a Foreign Language. After graduation, Sara will teach English in South Korea.

LINDSAY FILCHECK

The Roles of Sexuality and Campus Involvement in Perceived Social Support



Social support is related to positive outcomes, and sexual minorities typically have worse mental health outcomes than their heterosexual counterparts (Mongelli et al., 2019; Perez, 2016; Snapp et al., 2015). Campus involvement, especially in terms of connectedness with others with similar characteristics, is related to higher levels of perceived social support, and involvement with other LGBTQ+ individuals is extremely important for sexual minorities (Frost et al., 2016; Gleibs et al., 2011; Rickard & Yancey, 2018; Samson, 2019). The hypothesis of this study is that all students, especially those who identify as sexual minorities, perceive themselves as receiving high levels of social support from campus organizations and that campus organizations are perceived by students as being very effective in providing social support. Additional hypotheses regarding Allies organizations could not be tested due to a small sample size.

University students were surveyed in two different studies (N=57, N=54) using the MOS Social Support Survey and demographic questions. The results of several two-sample t-tests and a multiple regression test were utilized to compare the perceived social support scores of sexual minorities and heterosexual individuals and the perceived effectiveness of campus organizations in providing social support, respectively. Findings suggest that sexual minorities perceive themselves as receiving

significantly less social support than their peers, especially in regard to the measure of affectionate support, and that campus organizations were not significant to perceived social support, contrary to the hypothesis for this study. This implies that sexual minorities may face a number of negative outcomes due to a perceived lack of social support, especially in regard to current difficulties related to the pandemic. These individuals may also need more culturally appropriate opportunities to receive social support, and campus organizations in general may want to work on more ways of providing social support. However, due to the small sample size, the findings of this study are purely speculative, and such a study would need to be repeated on a larger scale in order to confirm their validity. Further limitations of the study include a small number of sexual minority participants, an almost exclusively female sample and a number of possible confounds related to analyzing two studies together.

Dr. Jeanne M. Slattery, Advisor

Lindsay is from Uniontown, Pa. The psychology major and women and gender studies minor will receive a Bachelor of Science degree upon graduation. At Clarion, Lindsay was the Psychology Club and Psi Chi president. In addition to earning a 4.0 QPA and Dean's List recognition, Lindsay was named Psychology Department Student of the Month (October 2020). She also received the Eric S. Knotick Memorial Scholarship (2020), John W. Mochnick Honors Scholarship (2020), Psychology Scholarship Endowment (2020), Dr. Iseli K. Krauss Psychology Scholarship (2019), Eberly Family Scholarship, (2018–2021), Clarion Leadership Award (2018–2021), Golden Eagle Scholarship (2018) and the Walter Hart Scholarship (2018). After graduation, Lindsay will attend Marshall University in Huntington, WV, to pursue a doctorate degree in clinical psychology and work in therapeutic settings with underserved communities.

KAITLYN E. GAGE

**Examining ImPACT Testing in High School Athletes:
Do Players Sit Out?**



The purpose of this study was to examine the literature to determine if high school athletes are appropriately avoiding play after sustaining a mild traumatic brain injury, also known as a concussion. After immediate injury, players are given an ImPACT test to determine if they have sustained the concussion.

Existing data is showing a cause for concern in high school athletes. Many studies conclude that athletes do not take time off from their sport or will try to hide symptoms to return to play. The results compiled from examining literature suggest that more studies need to be done to establish the validity of the ImPACT test. Overall, nothing can be determined regarding ImPACT testing until further studies are conducted.

Dr. Mary Pat McCarthy, Advisor

Kaitlyn is from Saegertown, Pa., and will receive a Bachelor of Science in Speech Pathology and Audiology degree upon graduation. She plans to attend Clarion University to obtain a Master of Science in Speech Language Pathology.

MYKENZIE HOFFMAN

Plaque Biofilm Organisms and Molecular Characterization



As a pre-dental student, I have been interested in and focused on researching the formation of biofilms within the oral cavity, commonly known as plaque. Plaque is the main culprit in tooth decay, and the accumulation of plaque can lead to systemic health issues if left untreated.

Within the oral cavity, there are thousands of bacteria that compose the oral biome, but only some of these bacteria contribute to the formation of oral biofilms as either primary or secondary formers. This research addresses the specific species responsible for biofilm formation, mechanisms of formation, aspects that affect formation, and ways to reduce and prevent excessive plaque formation.

Dr. Douglas Smith, Advisor

MyKenzie Hoffman is from York Springs, Pa. Upon graduation, she will be receiving a Bachelor of Science in Molecular Biology/Biotechnology with a concentration in pre-dentistry and minor in art. Throughout her undergraduate career, MyKenzie was a member of Delta Zeta Sorority and Beta Beta Beta Biological Honors Society. She was the secretary of the Health Careers Club and vice president for Translational Research in Medicine Club. In 2018 and 2019, MyKenzie presented undergraduate research findings at the Commonwealth of Pennsylvania University Biologists Conference and received the Civic Engagement Scholarship (2018–2019, 2019–2020). Following graduation, MyKenzie plans to attend Lake Erie College of Osteopathic Medicine School of Dental Medicine in July. After dental school, she hopes to specialize in either orthodontics or pediatric dentistry.

LEVI HUGHES

Wearing Scrubs Outside the Hospital Environment



Nurse's scrubs are contaminated with infectious microorganisms that can be harmful to patients and others around them. The bacteria may easily be transmitted from nurse to patient while providing care.

It is also common for workers wearing scrubs to run to the grocery store after work or stop at their favorite coffee shop during break. Nurses may then be exposing the public to this bacteria when they wear their scrubs outside of the hospital.

Ms. Melanie Best, Advisor

Levi Hughes is from Philipsburg, Pa., and will receive a Bachelor of Science in Nursing (BSN) upon graduation. Throughout his undergraduate career, Levi has maintained a 4.0 G.P.A and received the Clarion University High Achiever Scholarship. After graduation, Levi plans to start his nursing career at Mount Nittany Medical Center in the Medical/Surgical Unit.

MACY McCARTHY

Effects of Anxiety in the Classroom



Anxiety seems to be taking its toll on many people in today's society. Educational literature and professionals in the field seem to support that students may be one of the specific groups in society who are struggling the most.

It is possible that anxiety is the cause of many students' low performance and mistaken behavior in the classroom. Also, research demonstrates that teachers are struggling from the condition as well, and their struggles are having profound effects on their students.

This project responds to the idea of anxiety being a real problem in the field of education by discussing the findings of various researchers and professionals on the effects of anxiety in the classroom. It also highlights various prevention and treatment strategies that teachers can use to help alleviate their students' stress.

This project analyzes research on various topics concerning anxiety in students. Additionally, interviews of various educational professionals are analyzed and presented. This project concludes with a compilation of the information into a tool of stress reducing techniques that teachers can provide for their students' use in the classroom.

Dr. Amy K. Shannonhouse, Advisor

Macy is from Benton, Pa., and will receive Bachelor of Science in Education degrees in both early childhood and special education, and an Associate of Science in Athletic Coaching degree upon graduation. She received Dean's List recognition from Fall 2018 to Fall 2020. Macy was the Pennsylvania State Athletic Conference Scholar Athlete from 2019 to 2021 and a Clarion University Scholar Athlete from 2019 to 2021. In 2019, Macy was inducted into the Kappa Delta Pi International Honor Society in Education. Following graduation, Macy plans to find a position in the field of education and coach soccer.

LOGAN MOORE

Impact of COVID-19 on Workplace Management, Training and Communication



This past year has been one of the most trying that we have ever seen, and we can be sure that it has produced changes that will be seen long after the year 2020, especially in terms of the modern workplace.

Many businesses have begun to run almost 100% virtually with no employees showing up for work in a central office location, and it has posed some major challenges that were never seen before. This project looks to identify issues of this nature such as virtual communication, team building complexities, inadequate training programs and difficulties of supervision. It also identifies possible remedies for these issues and highlights how companies that are able to make changes can become much more efficient in comparison to their competitors.

Dr. Daniel Smith, Advisor

Logan Moore is from Philipsburg, Pa. He will receive a Bachelor of Science in Business Administration upon graduation as a business management and human resources management double major. As a full-time student, Logan was also the fundraising chair of SAM/SHRM.

ISABELLE MORRISON

The Inquiry Design Model of Social Studies Education



This project focuses on the evolving role of social studies in secondary education, including ways to help connect social studies to other subjects.

Dr. Jesse Haight, Advisor

Isabelle Morrison is from Kennett Square, Pa. She is a secondary education social studies major and political science and history minor. Upon graduation, she will receive a Bachelor of Science in Education degree. Isabelle plans to find a full-time teaching job after graduation.

THOMAS PEYTON JR.

Platelet Mediated Regenerative Technology



Regenerative technology mediated by platelet-based compounds is a new discovery in recent years. Often used in dental work, platelet rich plasma and fibrin have been injected and used as a cover for surgical sites, degenerated joints and even dry socket. Importantly, we explore the distinct differences in these blood isolates.

Dr. Douglas Smith, Advisor

Thomas Peyton Jr. is from Edinboro, Pa. Upon graduation, he will receive a Bachelor of Science degree as a molecular biology major and sociology minor. After graduation, Thomas hopes to begin working in his field of study.

CYRIQUE PITT

Stimulation:

A Revamp of the Honors Program Website



My senior project revolves around remodeling the Honors program website. This included the following tasks:

- Adding new photos and videos.
- Touching up descriptions and other scripts.
- Adjusting old fonts and statistics to reflect current figures.
- Touching up backgrounds and color schemes.

Professor William Adams, Advisor

Cyrique Pitt is from Reisterstown, Md. He is a communication digital media major and will receive a Bachelor of Science degree upon graduation. Throughout his undergraduate career, Cyrique has been a persistent and innovative digital media student who has gained extensive experience in video and photo content. He has created more than 40 short-form videos within a tight deadline for promotional use. Following graduation, Cyrique plans to continue to build his brand and travel the world.

MEGAN SCHAEFER

A Study on Commuters' Preferences for 100% Low-Floor Streetcar



Currently, cities lack fully accessible and ecologically friendly public transportation options that individuals can use for their daily commutes. The 100% low-floor streetcar is a brand-new model that would provide accessibility, through end-to-end, low-floor boarding, to all riders including elderly and disabled communities while simultaneously reducing GHG emissions. However, the struggle lies in the vehicle's multi-million-dollar investment and unforeseen customer demand.

This project seeks to evaluate the attitudes and intentions of end-users to ride the 100% low-floor streetcar through a quantitative survey analysis using Structural Equation Modeling (SEM). The end-results will be used to predict the demand for this mode of transportation, thus demonstrating the need for municipalities to implement the 100% low-floor streetcar into their cities.

Dr. Nripendra Singh, Advisor

Megan Schaefer is from Mars, Pa. Upon graduation, she will receive a Bachelor of Science in Business Administration in Management and Marketing. Throughout her undergraduate career, Megan was the president and risk reduction and education chairman of Zeta Tau Alpha Fraternity. She served as vice president of recruitment for Panhellenic Council (2020–2021) as well as student director of the Honors Program (2019–2021). Over the past four years, Megan has received Dean's List recognition and was awarded several scholarships including the Marketing Development Scholarship, Marketing Research Scholarship, Marketing Management Scholarship and several Honors Program scholarships. Following graduation, Megan will start a position at The Bank of New York Mellon in Pittsburgh as an Emerging Leaders Program analyst. She will complete a one-year program with the opportunity to complete three four-month rotations throughout the human resources department. At the completion of the program, she will be placed in a permanent position in human resources.

JENNA TECH

Internationalizing Remarketed (Pre-Owned) Medical Equipment in Developing Countries through Donation Groups



KMA Remarketing is one of many that remarkets pre-owned medical equipment. KMA Remarketing has been intrigued with the idea to increase international sales once again. After extensive research, it found a new way to do so through donation groups to developing countries. A country of interest is India with their vastly growing and maturing population.

During research, the COVID-19 pandemic was declared, therefore shifting to what medical equipment was promptly needed and how it might be accessed. The best solution during this time was to make as many cold calls (and emails) as possible to donation groups and hospitals. This created lists of prospective leads and any equipment in high demand for KMA Remarketing to use. This project has helped further develop my research, social and personal skills.

Dr. Nripendra Singh, Advisor

Jenna Tech is from Erie, Pa. Upon graduation, she will receive a Bachelor of Science in Business Administration degree as a finance and marketing major with a concentration in corporate and personal finance. Throughout her time at Clarion University, Jenna received Dean's List recognition as well as the Scholar-Athlete Award and the Clarion High Achiever Award. Following graduation, Jenna plans to become a staff accountant.

KIMBERLY WESTOVER

The Role of Annexin A1 in the Phagocytosis of Undifferentiated Cancer Cells by Macrophage-Like Cells as a Potential Cancer Therapeutic for Myeloid Leukemias



Annexin A1 is a protein that uses phospholipids and calcium to bind to various substances. Annexin A1 is known to have roles in apoptosis and inflammation. This project specifically focuses on annexin A1's role in the phagocytosis of undifferentiated HL60s by macrophage-like cells. HL60s are a specific cancerous cell line derived from a patient with acute myeloid leukemia. HL60s have the ability to differentiate into macrophage-like and neutrophil-like cells. Previous students using these cell types in a control discovered that undifferentiated HL60s were more readily phagocytosed by macrophage-like cells in the presence of annexin A1. The project's goal is to confirm the phagocytosis of cancer cells occurred and to study the role of annexin A1 in this process.

If annexin A1 does stimulate cancer cell phagocytosis, then this project could be a potential cancer therapeutic option for patients with acute myeloid leukemias. If it is understood how annexin A1 stimulates the macrophage-like cells to phagocytose the cancer cells, it could be possible to implement a similar treatment clinically. Doctors could harvest leukemia cells from a patient, differentiate them into macrophages, add annexin A1 and reintroduce them back into the body to kill the original leukemia cells. Obviously, a lot of research needs to be conducted before this can be a possibility, but it starts with our project researching how annexin A1 stimulates the phagocytosis of the undifferentiated HL60 cells.

Dr. Douglas Smith and Dr. Brzoza-Lewis, Advisors

Kimberly Westover is from New Bethlehem, Pa. Upon graduation, she will receive a Bachelor of Science in Molecular Biology degree. At Clarion University, Kimberly was secretary of translational research in the Medicine Club as well as a member of Tri Beta and Phi Eta Sigma. In 2021, she was recognized as CPUB Outstanding Student at Clarion University. In addition to Dean's List recognition, Kimberly received multiple scholarships throughout her undergraduate career, including Golden Eagle Scholarship (2018, 2019, 2020) Christopher John Stahlman Memorial Scholarship – Clarion Limestone High School (2018, 2019), Donna Dupont Bishop Presidential Scholarship (2018, 2019), Sara Ciccirelli Scholarship, Ruth Montgomery Math/Science Scholarship, Nancy Shaw McKee Memorial Scholarship, APSCUF and PSECU scholarships as well as several Honors Program scholarships. Following graduation, Kimberly will attend UTSW to obtain her Ph.D. in cancer biology.

ZACHARY WILDESON

Plasmid Recovery of Novel UPRE



Under normal cellular conditions, a quarter of all proteins are misfolded upon synthesis. The cell manages this influx of misfolded proteins via a constitutive recycling mechanism. Under conditions where there is an influx of aberrant proteins, the cell utilizes an inducible mechanism, termed the Unfolded Protein Response (UPR), to clear protein aggregates. Initiation of UPR upregulates nearly 300 different genes, with one-tenth of these being known in their function, an example of which is the expansion of the ER. Upregulation of these mentioned genes results from the UPR signaling pathway, which results in the translation of Hac1p, which subsequently binds to promoter regions, Unfolded Protein Response Elements (UPRE), upregulating UPR associated genes. Prior research has identified a known UPRE bound by Hac1p and functions in the upregulation of the UPR. Additionally, a further novel UPRE has been discovered that is believed to function the same as the putative UPRE. Characterization of the putative UPRE's affinity for Hac1p via a Beta-galactosidase assay is currently being carried out to create a baseline of response to differing chemical stressors.

Currently, all β -galactosidase testing has been carried out utilizing a plasmid containing the putative UPRE that is used to upregulate the neighboring β -galactosidase gene on the plasmid (pJC104). The focus of this study is to perform a plasmid rescue with the novel UPRE. The new recombinant plasmid is then used in further β -galactosidase assays with chemical stressors matching those from which the putative UPRE's baseline was built. Conducting β -galactosidase assay on this new recombinant plasmid will allow for a baseline of the novel UPRE to be created. Having these two baselines will allow for the comparison of the novel to the putative. Upon comparison, the hope is to observe the two baselines as comparable in intensity and presence for each chemical stressor. If the baselines are comparable between the two plasmids, this will strengthen the consideration of the novel UPRE as being a putative UPRE that functions to upregulate UPR target genes.

Dr. Scott, Advisor

Zachary Wildeson is from Brookville, Pa. Upon graduation, he will receive a Bachelor of Science in Biology. Throughout his time at Clarion University, Zachary headed a division of Dr. Scott's research lab and presented research findings at CPUB.

**CLARION UNIVERSITY ADMINISTRATION
2020-2021**

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Dr. Phillip Frese, Dean, College of Business Administration and Information Sciences

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